

Work Order ID 141822

141822

Page 1

Wednesday, February 17, 2016 7:35:40 AM

Item ID: D6020-160 Accept *N900040100* Setup Start *NS1*
Revision ID: Stop *NS2*
Item Name: Crosstube Material
Start Date: 2/17/2016 Start Qty: 14.00 *14* Cust Item ID:
Required Date: 3/31/2016 Req'd Qty: 14.00 *14* Customer:
Reference:

Approvals: Process Plan: Date: FEB 17 2016 Tooling: Date: Run Start *NR1*
QC: Date: SPC (Y/N): Date: Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D6020	pa3								
110		0.00							DAS 13 9-89
110	PURCHASING								
Purchasing	Memo	0.00							
Purchasing	Issue P/O: 31388								
	Manufacture as per dwg D6020								
120		0.00							
120	Receive & Inspect for Damage & Mat'l Certs								
Packaging	Memo	0.00							
Packaging	Ensure material certification is attached								
130		0.00							
130	QC- Inspect dimensions to drawing								
QC	Memo	0.00							
Quality Control	Ensure Material certification comply to Dwg								

Wednesday, February 17, 2016 7:35:40 AM

Page 2

Quality Control

Work Order ID 141822

141822

Page 3

Wednesday, February 17, 2016 7:35:40 AM

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Item Name: Crosstube Material
Start Date: 2/17/2016 Start Qty: 14.00 *14* Cust Item ID:
Required Date: 3/31/2016 Req'd Qty: 14.00 *14* Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start *NR1*
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
190	Identify as per dwg & Stock Location: <i>Shed</i>	0.00							
190	Memo	0.00							
Packaging									
Packaging									
	<i>Tubes Not Identified, Create Identified</i>								
200	QC21- Final Inspection - Work Order Release	0.00							
200	Memo	0.02							
QC									
Quality Control									

16/11/21

16-11-17

Picklist Print

Wednesday, February 17, 2016 7:35:39 AM

Page 1

Work Order ID: 141822

141822

Parent Item: D6020-160

D6020-160

Parent Item Name: Crosstube Material

Start Date: 2/17/2016

Required Date: 3/31/2016

Start Qty: 14.00

Required Qty: 14.00

Comments: IPP REV:A 13.03.06 NEW ISSUE DD VERF:JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6020-160P		Purchased		No			Each	14.0000		14			
D6020-160P									**				
Crosstube Material													

Location

Loc Qty

Loc Code

HALL

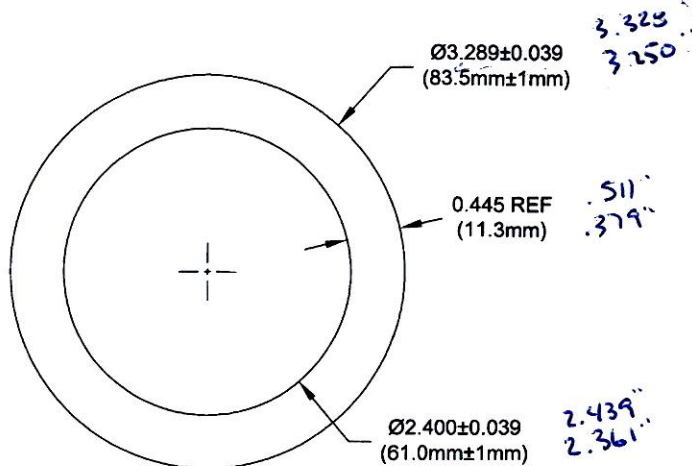
14

133623

14

14x SP/6-7-25

SPECIFICATION CONTROL DRAWING



NOTES

1) D6020-XXX CROSSTUBE

LENGTH

WHERE XXX IS LENGTH IN INCHES
EG. 160" LONG TUBE: D6020-160

2) MATERIAL: 17-4PH SEAMLESS STAINLESS STEEL TUBE PER ASTM A564
 $\varnothing 3.289$ O.D. x $\varnothing 2.400$ I.D.

HEAT TREAT TO H1025 CONDITION (HRc 34-42):
MIN. ULTIMATE TENSILE STRENGTH = 155 ksi
MIN. YIELD TENSILE STRENGTH = 145 ksi

3) TOLERANCES ARE AS FOLLOWS:
ECCENTRICITY: 15% (+/-0.066" WALL)
LENGTH: XXX +0.188"/-0.000"
STRAIGHTNESS: 0.012" DEVIATION / 12" LENGTH

4) ALL DIMENSIONS ARE IN INCHES

5) TUBE MUST BE PICKLED OR ELECTROPOLISHED TO BE SMOOTH AND FREE FROM SCALE.

6) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

release 822

RELEASED
2013-08-14

REV.	NEW ISSUE	CP	13.04.24
DESIGN	DESCRIPTION	BY	DATE
DRAWN	<i>Q</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>Q</i>		
MFG. APPR.	<i>Q</i>	D6020	REV. A
APPROVED	<i>Q</i>	TITLE	SHEET 1 OF 1
DE APPR.	<i>Q</i>	CROSSTUBE MATERIAL	SCALE
DATE	13.04.24	COPYRIGHT © 2013 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD	



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO31388**

Purchase Order Date 2/17/2016 10:32:38 AM

PO Print Date 4/4/2016

Page Number 1 of 2

Order From :

VU-THI01

Ship To : DART AEROSPACE LTD

TUBE HOLLOWS INTERNATIONAL
39 ENTERPRISE DRIVE SUITE 2

1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

WINDHAM, MAINE 04062
UNITED STATES

Revised dates

Contact Name

Buyer

Chantal Lavoie

Vendor Phone

207-892-8899

Customer POID

Customer Tax #

10127-2607

Ship To Contact

Terms

Net 30

Ship To Phone

Currency

USD

Ship Via:

Journey Freight collect

FOB

EXW - (Ex Works)

Ship Acct:

Line Nbr	Reference Vendor Part Number Line Comments Delivery Comments	Description/ Mfg ID	Req Date/ Taxable Promise Date	CD	Req Qty/ Unit of Measure	PO Unit Price	Extended Price
1	D6020-160P MATERIAL: 17-4PH SEAMLESS STAINLESS STEEL TUBE PER ASTM A564, HEAT TREAT TO H1025 CONDITION (HRc 34-42), MIN. ULTIMATE TENSILE STRENGTH = 155 ksi, MIN. YIELD TENSILE STRENGTH = 145 ksi TOLERANCES ARE AS FOLLOWS: ECCENTRICITY: 15% (+/-0.066" WALL) LENGTH: XXX +0.188"/-0.000" STRAIGHTNESS: 0.012" DEVIATION / 12" LENGTH B141822	Crosstube Material	7/1/2016 Yes 7/1/2016		14.00 Each	\$3,490.50	\$48,867.00
						Line Total:	\$48,867.00
3	D6020-160P MATERIAL AND TOLERANCES SAME AS ABOVE B141823	Crosstube Material	9/1/2016 Yes 9/1/2016		14.00 Each	\$3,491.50	\$48,881.00
						Line Total:	\$48,881.00

Sp 16-725

Note:

4/4/2016

STATEMENT OF CONFORMANCE

Dart Aerospace Ltd.
1270 Aberdeen
Hawkesbury, ON K6A 1K7

Part #: D6020-160P
Material: 17-4 PH
Report Serial #: 5202710
Heat #: 267829
Drawing #: D6020 Rev. A
P.O #: PO31388 L/I 1
THI WO#: 160304/01
Qty: 14

SN's: 1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 13, 14, 15, 16

The above-mentioned parts have been inspected and conform to customer contract, purchase order, drawing, and other required specifications. All exceptions are noted below. Inspection data and all certifications are kept on file and available for review upon customer request.

Comments:

SA/6-7-25

Inspected / Certified By:



Christine Plummer, Quality Dept. July 15, 2016

PACKING LIST

TUBE HOLLOW INTERNATIONAL

39 ENTERPRISE DRIVE
SUITE 2
WINDHAM, ME 04062
PHONE: 207-892-8899 FAX: 207-892-8863

Packlist ID: 01784
Date: 7/15/2016
Page: 1

Sold To Address

DART AEROSPACE LTD.
1270 ABERDEEN ST.
HAWKESBURY K6A 1K7
CANADA

Ship To Address

DART AEROSPACE LTD.
1270 ABERDEEN ST.
HAWKESBURY K6A 1K7
CANADA

CUSTOMER-PO			PAYMENT TERMS		F.O.B.
PO31388			Net 30		WINDHAM
SALES REP ID			SHIPPING METHOD	SHIP DATE	OUR ORDER NUMBER
EVAN			JOURNEY FREIGHT	7/18/2016	DAR160047
QUANTITY					
ORD	SHIP	BCK	CUSTOMER PART ID	DESCRIPTION	

14.00 14.00 0.00

160" CROSSTUBE
Drawing:
Rev No:
Unit of Measure: EA

TUBE HOLLOW INTERNATIONAL SUPPLIED 17-4PH
MATERIAL, MACHINED PER DWG.# D6020 REV A.

S/N: 1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 13, 14, 15, 16

RE: THI WO# 160304/01

THANK YOU FOR THIS ORDER.

MATERIAL: 17-4 SEAMLESS STAINLESS STEEL TUBE PER
ASTM A564, HEAT TREAT TO H1025 CONDITION, (HRc
34-42), MIN. ULTIMATE TENSILE STRENGTH = 155ksi, MIN
YIELD TENSILE STRENGTH =145ksi.

TOLERANCES ARE AS FOLLOWS:
ECCENTRICITY: 15% (+/-0.066" WALL).
LENGTH: XXX +0.188"/0.000".
STRAIGHTNESS: 0.012" DEVIATION / 12" LENGTH.

PROCUREMENT QUALITY CLAUSES AS SHOWN ON PO.

RECEIVED BY:

SP/6-7-25

**VALBRUNA**

SLATER STAINLESS, INC.

2400 TAYLOR STREET WEST - PO BOX 630
FORT WAYNE IN 46802 USA
PHONE 260.434.2800 - FAX 260.434.2801**Product Certification Report**Report Number: **5202710**

Certified on Mar 02, 2016 Page 1 of 2

Order I.D. 1600363 001		Order Date 2/25/16		Commodity Code	
Dim 1 3.5000	Dim 2 .0000	Dim 3 .0000	Heat I.D. 267829	Customer I.D. 001417	Customer Purchase Order PO20422
Product Shape Rounds			Product Surface HR & Rough Turned		Customer Grade 630
Length (Inches) 160.000 Min. 162.000 Max.			Bill of Lading # 426627	Weight	Melt Date: 6/01/15

**Ship
To**

Attention: Penn Stainless Prod
Tube Hollows International
39 Enterprise Dr.
Suite 2
Windham, ME 04062

**Sold
To**

VALBRUNA STAINLESS, INC.
2400 TAYLOR STREET WEST
FORT WAYNE, IN 46802

Lifts: 0035 0036 0038 0039 0040 0041 0042 0071 0072

Condition H-1025 AMS H 6875B ASTMA 564-13

ASMESA 564 13 AMS 5643T (except finish) ASTM A564-10

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Cr	Ni	Mo	Cu	N	Cb	Ta	Cb+Ta
.038	.60	.025	.024	.39	15.84	4.39	.29	3.20	.03	.26	.002	.262

ROCKWELL HARDNESS ASTM E18-15

HRC

38.0

TENSILE PROPERTIES ASTM E8-15a

TS (PSI)	.2%YS (PSI)	%EL(2")	%RA
161100	154200	18.2	59.7

CHARPY V NOTCH E23-12c

TEMP	FT/LB	FT/LB	FT/LB	LAT EX	LAT EX	LAT EX	AVG FT LB	TEST(F)
70	49	46	52	29	27	37	49	70

MAGNETIC PARTICLE to AMS2303F

FREQ SEV

AVG .00 .00

PRODUCTION HEAT TREATMENT

SOL-ANN(F)	SOL-ANN(HR)	QUENCH	AGE(F)	AGE(HR)	QUENCH
1900	6.00	Air	1025	4	Air

MACRO ASTM E340-15/E381-01

MACRO

OK

OK

OK

PERCENT FERRITE (AMS 2315)

% FERRITE Etchant Magnification X

AVG .6 Marbles 100

Free of mercury and low melting alloy contamination.

No welding or weld repair done.

Reduction ratio 5 To 1 Min.

Specimen tested at longitudinal, mid-radius, room temperature.

Electric Furnace melted; AOD refined.

Results relate only to the items tested. Certification shall not be reproduced except in full, without written approval of Valbruna Stainless Inc. The recording of false, fictitious, or fraudulent statements on this document may be punished as a felony under federal statutes. Including Federal law Title 18, Chapter 47. Consult material safety data sheet (MSDS) for hazard info. I hereby certify that the reported figures are correct as contained in the records of the corporation.

Manager Laboratory Services

email: DHackett@valbruna.us

Dennis Hackett

**VALBRUNA****SLATER STAINLESS, INC.**2400 TAYLOR STREET WEST - PO BOX 630
FORT WAYNE IN 46802 USA
PHONE 260.434.2800 - FAX 260.434.2801**Product Certification Report****Report Number: 5202710**

Certified on Mar 02, 2016 Page 2 of 2

Order I.D. 1600363 001		Order Date 2/25/16		Commodity Code	
Dim 1 3.5000	Dim 2 .0000	Dim 3 .0000	Heat I.D. 267829	Customer I.D. 001417	Customer Purchase Order PO20422
Product Shape Rounds			Product Surface HR & Rough Turned		Customer Grade 630
Length (Inches) 160.000 Min. 162.000 Max.			Bill of Lading # 426627	Weight	Melt Date: 6/01/15

**Ship
To**Attention: Penn Stainless Prod
Tube Hollows International
39 Enterprise Dr.
Suite 2
Windham, ME 04062**Sold
To**VALBRUNA STAINLESS, INC.
2400 TAYLOR STREET WEST
FORT WAYNE, IN 46802

Specimen size: tensile - .505 in. charpy - 10mm X 10mm

Annealed soak times controlled by atmosphere thermocouples. Age soak times by contact thermocouples.

Material produced in accordance with VSSI Quality Policy Manual Revision 6, dated 7/07/2011.

Ultrasonic tested to ASTM A 388 per acceptance level API 6A PSL3 satisfactory.

Melted in Italy per DFARS clause 225.872.

Chemical testing to one or more of the listed ASTM methods:

E415-14, E1019-11, E1086-14.

Location of tensile fracture: inside middle of gage length. %elong after fracture.

Chemical Analysis performed at Acciaierie Valbruna, Italy.

No mercury or low melting alloy contamination. No weld repair.

Material melted in Italy, manufactured in the United States.

Material conforms to listed specifications and is DFARS compliant.

Quality system is compliant with ISO 9001:2008. Produced in accordance with EN 10204 3.1.

Results relate only to the items tested. Certification shall not be reproduced except in full, without written approval of Valbruna Stainless Inc. The recording of false, fictitious, or fraudulent statements on this document may be punished as a felony under federal statutes. Including Federal law Title 18, Chapter 47. Consult material safety data sheet (MSDS) for hazard info. I hereby certify that the reported figures are correct as contained in the records of the corporation.

Manager Laboratory Services

email: DHackett@valbruna.us

Dennis Hackett

**Penn Stainless Products**

190 Kelly Road
Quakertown, PA 18951
Phone: (800) 222-6144 Fax: (215) 536-3255

✓ **Certificate Of Compliance**
Bill Of Lading

Page 1 of 1 I220578
REPRINT

SOLD TO: 00008925
TUBE HOLLOWES INTERNATIONAL
39 ENTERPRISE DRIVE
SUITE 2
WINDHAM, ME 04062

SHIP TO:
TUBE HOLLOWES INTERNATIONAL
39 ENTERPRISE DRIVE
SUITE 2
WINDHAM, ME 04062

SPECIAL INSTRUCTIONS

Contact: TODD

Ship Terms: FOB DESTINATION MTR:O

Currency		Sales Person		Phone	Fax	Customer PO	
USD		LINDSAY ELY		(207) 892-2352	(207) 892-8867	ES-0216-332 ✓	
Sales Order	FOB Point	Terms	Ship Via		Date Ordered	Date Required	Date Shipped
W233402	FOB DESTINATION	NET 30 DAYS	COMMON CARRIER - 999		02/24/16	03/04/16	03/10/16

LN	Description	Bundle #	Heat #	Ordered	Back Ordered	Shipped	Unit
0001	STNLS ROUND BAR SRB 17-4 H1025 3.5" x 160" +2"/-0" HRc 34-42 ✓ ASTM A564 SHIPPING TOLERANCE +/- 10% ✓ MUST SHIP AT LEAST 42 BARS ✓ 18,707 LB / 42 PC ✓ Mill: ACCIATERIE VALBRUNA SRL REC HRS: 08:00 AM - 04:00 PM, M - F UNLOADING: FORKLIFT / 5,000# MAX THIS IS TO CERTIFY THAT THE MATERIAL FURNISHED ON THE SUBJECT PURCHASE ORDER IS IN ACCORDANCE TO THE DESCRIPTION AND/OR SPECIFICATION SHOWN ABOVE ----- All sales subject to Penn Stainless Products, Inc. terms and conditions found @ www.pennstainless.com ----- <i>14 BARS EA NO# 160304/01, 160304/02 & 160304/03</i> <i>TH</i>	L980862	267829	19,000		18,707	LB
				Approx Weight:		18,707	LB

Cert OK
Todd Harding
3/7/16

Received by: _____ Date: _____ Signature: _____

EXTRUSION INSPECTION SHEET



TUBE #	TOTAL LENGTH	SIDE A		SIDE B		Measurement unit		Inches	Symbol	"	ULTRA SONIC MEASUREMENTS						
		DIA		DIA		INSIDE DIA	wall thickness measured w/vern				Strightness at 12" in middle	Rockwell Reading	LOCATION on tube	R1	R2	R3	R4
		R1	R2	R1	R2												
DWG										N/A	Middle	N/A					
1	161.25	3.308	3.312	3.309	3.309	2.369	.467	.470		N/A	Middle	465	467	469	467		
2	162	3.321	3.330	3.326	3.327	2.374	.472	.478		N/A	Middle	471	471	471	471		
3	162	3.319	3.320	3.321	3.319	2.371	.472	.476		N/A	Middle	472	471	471	471		
4	162	3.321	3.322	3.322	3.323	2.370	.474	.480		N/A	Middle	471	471	471	471		
5										N/A	Middle						
6										N/A	Middle						
7										N/A	Middle						
8										N/A	Middle						
9										N/A	Middle						
10										N/A	Middle						
11										N/A	Middle						
12										N/A	Middle						
13										N/A	Middle						
14										N/A	Middle						
15										N/A	Middle						
16										N/A	Middle						
PART #		P/O#				BATCH #				Notes:							

66020-160

710 31388

141822